



Effects of climate change on tularaemia disease activity in Sweden

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Abstract:

Tularaemia is a vector-borne infectious disease. A large majority of cases transmitted to humans by blood-feeding arthropods occur during the summer season and is linked to increased temperatures. Therefore, the effect of climate change is likely to have an effect on tularaemia transmission patterns in highly endemic areas of Sweden. In this report, we use simulated climate change scenario data and empirical data of temperatures critical to tularaemia transmission to forecast tularaemia outbreak activity. The five high-endemic counties: Dalarna, Gavleborg, Norrbotten, Varmland and Orebro represent only 14.6% of the total population of Sweden, but have recorded 40.1-81.1% of the number of annual human tularaemia in Sweden from 1997 until 2008. We project here earlier starts and a later termination of future tularaemia outbreaks for the time period 2010-2100. For five localised outbreak areas; Gagnef (Dalarna), Ljusdal (Gavleborg), Harads (Norrbotten), Karlstad (Varmland) and Orebro municipality (Orebro), the climate scenario suggests an approximately 2 degrees C increase in monthly average summer temperatures leading to increases in outbreak durations ranging from 3.5 weeks (Harads) to 6.6 weeks (Karlstad) between 2010 and 2100. In contrast, an analysis of precipitation scenarios indicates fairly stable projected levels of precipitation during the summer months. Thus, there should not be an increased abundance of late summer mosquitoes that are believed to be main vectors for transmission to humans in these areas. In conclusion, the results indicate that the future climate changes will lead to an increased burden of tularaemia in high-endemic areas of Sweden during the coming decades.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2799307>

Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Special Report on Emissions Scenarios (SRES) Scenario: SRES B2

Other Climate Scenario: RCA3

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

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Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Sweden

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Tick-borne Disease

Tick-borne Disease: Other Tick-borne Disease

Tick-borne Disease (other): Tularaemia

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

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Long-Term (>50 years)

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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